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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,580	10/31/2003	Jerome P. Fanucci	KAZAK-014XX	1649

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EXAMINER	
COLLINS, TIMOTHY D	

ART UNIT	PAPER NUMBER
3643	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/698,580	FANUCCI ET AL.	
	Examiner	Art Unit	
	Timothy D Collins	3643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.

4a) Of the above claim(s) *13,14,17,27,34-36,38,40 and 45-60* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,15,16,18-26,28-33,37,39 and 41-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 21-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Re claims 21-26, the statement that the fibers extend spanwise is unclear. Spanwise is usually defined to mean approximately 90 degrees out from the fuselage or from the top planform of a craft it would be the whole width of the craft. However in this case it appears that the direction along the longitudinal axis of the wing is being discussed, however it is not clear if this is the case or not. Clarification of this is needed. It is also suggested that if the applicant means in the longitudinal direction of the wing then that is what should be claimed for clarity.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9, and 28-32 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 4364531 to Knoski (hereinafter called 531).

a. Re claim 1, 531 discloses an extendable wing system (figure 5), with a forward wing (34) extending from root (near 36) to tip (near 43). An aft wing (20) is also included extending from root (near 32) to tip (near 18). The forward wing and aft wing pivotably coupled together (at 43 and 19) at a location outward of the root. Also a linkage mechanism translationally and rotationally coupled to the forward and aft roots as seen in figure 5 at least at (36 and 44) as well as (32 and 30) as seen in figure 7 at least. The translation follows the track and rotation is to allow for the wings to pivot with respect to each other to allow for the sliding in the track to occur.

b. Re claim 2, 531 also discloses an actuating mechanism as seen in figure 7 at numbers 38 and 42.

c. Re claim 3, 531 discloses that the actuating mechanism drives the aft wing root as seen in figure 7 because it drives the root section of wing 20.

d. Re claim 4, 531 discloses that the linkage provides a determined ratio of translation of the one root relative to the other. Note, this is because any ratio at all is a determined ratio even if it is 1:1 or any other. This ratio may not be specified but it is inherent that there is some ratio of movement because they do move relative to one another.

e. Re claim 5, 531 also discloses a linear rail (32 and 33) which the forward and aft wing roots slide on. The wing roots slide with blocks (30 in figure 7) and

also at about 44 the end of the wing that slides on the track is the "block" because it is the interacting section with the track.

f. Re claim 6, 531 discloses that the linkage further comprises a pivoting mechanism (as seen in figures at number 44 and between 30 and 28, pins are seen which provide the pivoting mechanism).

g. Re claim 7, 531 discloses in figure 7 that the aft wing root is laterally displaced with respect to the rail from the pivot point of the forward wing root as seen in numbers 30 and 28 of figure 7 and also in figure 5 at the aft root.

h. Re claim 8, see rejection of claim 2 above. Note, actuation of the forward "block" is accomplished via the movement of the actuation mechanism which is directly attached to the aft wing. Note also that the claim allows for indirect actuation of the "blocks".

i. Re claim 9, see rejection of claim 8 and 2 above.

j. Re claim 28, 531 discloses that the forward wing has an airfoil profile at least in figure 10.

k. Re claim 29, 531 discloses that at least one of the wings has a spanwise twist distribution. This is inherent because all wings have some twist distribution. The twist distribution might be "0" or untwisted or some other distribution but it exists in them all. Note: it is suggested that the applicant claim a specific twist distribution including actual numbers for the distribution.

l. Re claim 30, 531 discloses that the body has a fuselage, as seen in figure 1, and also that the wings stow against the fuselage and extend from opposite sides, as seen in figure 2 and 1.

m. Re claims 31 and 32, 531 discloses that the forward roots stow forward of the position when extended and also they are aft of the stowed position when extended in the deployed position, as seen in figures 1-4.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 10 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over 531 as seen above.

a. Re claim 10, 531 may not disclose that a pulley system can be used to actuate the forward and aft wing roots, however it is old and well known in the art that pulley systems and worm gear drives are equivalent means to cause a tranlational movement. Therefore it would have been obvious to one of ordinary skill in the art to have used a pulley system in place of a worm drive so as to allow for cheaper manufacturing and less precision milling of gears for the drive mechanism.

b. Re claim 33, 531 may not specifically disclose that the COP is further aft than COG when the wings are deployed, however it is old and well known in the art that for an inherently nose down stable flight this is the case. Therefore it would have been obvious to use an aft COP so as to give a stable flight to a craft such as a missile and to allow for easy targeting and control of the craft during its flight.

7. Claims 11,12,15,10, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over 531 as seen above and further in view of USPN 5901928 to Raskob, Jr. (hereinafter called 928).

c. Re claim 11, 531 may not specifically disclose an actuator element within the aft wing of the craft which deforms the wing, however it does disclose an actuator on the aft wing which deflects the wing in response to control signals. However it is old and well known in the art to use actuators which are embedded in wings to deform them. As proof of this, 928 does teach of an actuator in a wing which deforms the wing. This is seen in at least the abstract and background as well as in column 7 at lines 2-36. Therefore it would have been obvious to one of ordinary skill in the art to have applied the teachings of Piezoelectric actuators (in this case made of PZT) in wings into the device of 531 so as to control the craft through internal wing deformation rather than external actuators so as to minimize drag and radar cross-section.

d. Re claim 12, see discussion of claim 11 above.

e. Re claim 15, 531 may not specifically disclose an actuator element within the aft wing of the craft which deforms the wing torsionally however it is old and well known in the art to torsionally deform wings to effect control of a craft. For proof that this is old and well known, see the Wright Flyer which flew first in 1903. The Wright Flyer used "wing warping" or torsional deformation of the wing to control the craft. Therefore it would have been obvious to one of ordinary skill in the art to have applied the well known teachings of torsional deformation to control flight for the purpose of using less moving parts and making manufacturing and maintenance easier and cheaper. Also you would want to do this to minimize drag and radar cross-section as seen above.

f. Re claims 16,18 and 19, 531 may not specifically disclose an actuator element within the aft wing of the craft which deforms the wing is distributed along at least a portion of the wing. However 928 teaches that the PZT (piezoelectric device) strands are along a portion of a surface. Therefore it would have been obvious to distribute the PZT along the surface so as to allow for it to act over the surface and deform it near the root at the trailing edge for maximum effect. This would be done for efficient deformation and for a large controlling surface.

8. Claims 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over 531 as seen above and in view of 928 and further in view of http://www.wtec.org/loyola/polymers/c1_s6.htm (hereinafter called pultrusion).

g. Re claim 20, 531 may not specifically disclose that the wings are made from a pultrusion process, however pultrusion teaches of making wings of this process at least in page 2 at lines 7-10. Therefore it would have been obvious to one of ordinary skill in the art to have applied the teachings of pultrusion into the device of 531 so as to make a strong cheap structure that is also light weight.

9. Claims 37,39, and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over 531 as applied to claims 1-9 and 28-32 above, and further in view of USPN 5615846 to Shmoldas et al. (hereinafter called 846).

h. Re claims 37,39, and 41-44, 531 may not specifically disclose that both the wings roots are coupled for simultaneous translation, however the joined wing craft of 846 does teach of this. Therefore it would have been obvious to one of ordinary skill in the art to have applied the teachings of 846 into the device of 531 so as to provide for stable flight as in the case of 846. As seen in 846 the wing roots are coupled by the linkage system at least in figures 2 and 3. Also in 846 it can be seen that the wings are independently coupled to the linkage mechanism, because the wing roots are each coupled to it separately, and not to one another then to the linkage mechanism.

10. NOTE: it is suggested that the applicant claim further details of the wing structure with respect to the pivoting and sliding of the roots and the track structure. Also it is suggested that the applicant clearly claim further details of the forward roots

being closer to the nose of the craft while stowed, along with how the aft wing folds in behind the forward wing so as to preclude the use of the present art sited in this action.

Election/Restrictions

11. Applicant's election with traverse of claims 1-12,15,16,18-26,28-33,37,39, and 41-44 in the reply filed on 11-30-04 is acknowledged. The traversal is on the ground(s) that the examiner did not state how related inventions are distinct. This is not found persuasive because this argument is geared toward a restriction requirement not an election of species as is the case of the present requirement. As for the first restriction requirement that was sent on 7/7/04 it is noted that there was not any traversal of the restriction and therefore it is taken that this traversal is with respect to the instant election of species requirement and therefore the examiner maintains that the requirement is proper because there are many species in the application.

The requirement is still deemed proper and is therefore made FINAL.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following discloses missiles and wings and actuators.

i. USPN 6078674

j. USPN 5899410

k. USPN 6231013

l. USPN 4106727

m. USPN 5039030

n. USPN 5934967

o. USPN 3990656

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy D Collins whose telephone number is 703-306-9160. The examiner can normally be reached on M-Th, 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Poon can be reached on 703-308-2574. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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2/3/05